

The Effect of Active Range of Motion (ROM) Training on Muscle Strength of Non-Haemorrhagic Stroke Patients at the Jakarta Metropolitan Regional Police Health Center

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ABSTRACT

Non-hemorrhagic stroke causes delays in movement due to muscle weakness. In Indonesia, the death rate due to stroke occupies the first position in Southeast Asia. WHO stated that 328,524 Indonesians died from a stroke. The high incidence of stroke makes researchers want to know the effect of giving active Range Of Motion (ROM) on muscle strength in non-hemorrhagic stroke patients at the Polda Metro Jaya Health Center. This study aims to determine the effect of active range of motion (ROM) exercise on muscle strength in non-hemorrhagic stroke patients at the Polda Metro Jaya Health Center in 2021. Research design is a quantitative analytic with a pre-experiment (one group's pre-post test) design. The sample in this study amounted to 17 respondents, and the determination of the sample using simple random sampling. The independent variable is the active range of motion (ROM), and the dependent variable is muscle strength in non-hemorrhagic stroke patients. This study used the Wilcoxon statistical test. The results showed that there was an effect of giving ROM in non-hemorrhagic stroke patients. The results of the Wilcoxon test before and after ROM intervention in the upper extremity showed p-value = 0.001. Wilcoxon test results before and after ROM intervention in the lower extremities showed p-value = 0.002. This study concludes that there is an effect of giving active ROM on the muscle strength scale of the upper and lower extremities in non-hemorrhagic stroke patients at the Biddokkes Polda Metro Jaya. It is hoped that the patient's family can train ROM independently in family members who have had a stroke.

Keywords: active range of motion (ROM); muscle strength; non-hemorrhagic stroke

INTRODUCTION

Stroke is a disease where there is a blood circulation disorder in the brain resulting in a sudden neurological deficit. It occurs due to ischemia or haemorrhage of the nerve circulation in the brain. Three factors cause stroke: medical risk factors, behavioral risk factors, and other factors. Range of Motion (ROM) is a muscle exercise therapy to maintain the patient's ability to move the joint entirely and typically prevent the disability that can occur in stroke patients. ROM can be performed on the neck, upper and lower extremities; active movement tools, and it can move because of the cooperation with bones. Muscles can contract so that they can cause muscle fatigue. Muscle fatigue is related to muscle endurance. Muscle strength is defined as the ability of a muscle to generate force and tension during maximal effort carried out statically. Physiological factors that can affect muscle strength include (Irfan, 2010) age, gender, muscle strength, muscle temperature, food, and daily activity levels. This study aims to determine the effect of active range of motion (ROM) exercise on muscle strength in non-haemorrhagic stroke patients at the Jakarta Metropolitan Regional Police Health Center.

METHOD

This study uses a pre-experimental design with a pre-post-test design in one group (One group pre-post design). The sample in this study was Police personnel over the age of 50 who experienced a non-haemorrhagic stroke at the Jakarta Metropolitan Regional Police Health Center. The total sample in this study is 17. The sampling technique was non-random sampling with the purposive sampling method. This research was conducted at the Polyclinic of the Jakarta Metropolitan Regional Police during a Home Visit (a visit to a chronically-ill police officer) from November to December 2020. The research instrument used in this study was to use SOP ROM and observation sheets. Data analysis in this study is Wilcoxon. Research ethics in this study to protect respondents as subjects in the study.

RESULT

The study results describe the condition of the characteristics of the variables studied, namely: the effect of giving an Active Range of Motion (ROM) on muscle strength in non-haemorrhagic stroke patients at the Jakarta Metropolitan Regional Police Health Center, which is held once a week. The results of univariate research in this study describe the characteristics of each variable, such as demographic data of respondents, namely age and gender. Bivariate analysis used in this study is the Wilcoxon test because the distribution of the data is not normal ($p < 0.001$).

Table 1. Respondents' Characteristics (n=17)

Characteristics	n	%
Sex		
Male	16	94.1
Female	1	5.9
Chronic disease		
Hypertension	15	88.2
Diabetes Mellitus	2	11.8
Total	17	100.00

Table 2. Upper Extremity Muscle Strength of Respondents before and after Active ROM (n=17)

Active ROM Exercise	Muscle Strength Scale					Total	Median
	1	2	3	4	5		
Before Active ROM	1 (5.9%)	8 (47.1%)	8 (47.1%)	0 (0%)	0 (0%)	17 (100%)	2.00
After Active ROM	0 (0%)	3 (17.6%)	9 (52.9%)	5 (29.4%)	0 (0%)	17 (100%)	3.00

Table 3. Lower Extremity Muscle Strength of Respondents before and after Active ROM (n=17)

Active ROM Exercise	Muscle Strength Scale					Total	Median
	1	2	3	4	5		
Before Active ROM	1 (5.9%)	8 (47.1%)	8 (47.1%)	0 (0%)	0 (0%)	17 (100%)	2.00
After Active ROM	0 (0%)	3 (17.6%)	11 (64.7%)	3 (17.6%)	0 (0%)	17 (100%)	3.00

Table 4. Statistical Result of The Effect ROM of Active Range of Motion (ROM) Exercise on Upper Extremity Muscle Strength (n=17)

Observation	Changes in the level of muscle strength	n	Mean Rank	Sum of Ranks	p-value
Post-Pre	Negative Ranks	0	0.00	0.00	0.001
	Positive Ranks	12	6.50	78.00	
	Ties	5			

Table 5. Statistical Result of The Effect ROM of Active Range of Motion (ROM) Exercise on Lower Extremity Muscle Strength (n=17)

Observation	Changes in the level of muscle strength	n	Mean Rank	Sum of Ranks	p-value
Post-Pre	Negative Ranks	0	0.00	0.00	0.002
	Positive Ranks	10	5.50	55.00	
	Ties	7			

DISCUSSION

Several risk factors that causes stroke include age, gender, smoking habits, and other comorbidities (Setyopranoto, 2011). The study results in table 1. show that the majority of respondents who experienced a non-haemorrhagic stroke had male sex as many as 16 people or 94.1%. Table 2 shows that the respondent's upper extremity muscle strength ranges on a scale of 1, 2, and 3. These results indicate that many respondents experience less muscle strength when carrying out daily activities. Table 3 shows that the respondent's lower extremity muscle strength ranges on a scale of 1, 2, and 3. According to Santoso (2009), a decrease in lower extremity muscle strength in a person causes movements to become stiff and sluggish. The steps become short, and the legs are not vital to support the body. Table 4 shows the results of the Wilcoxon test with a p-value = 0.001 so that it can be interpreted that there is a change in the upper extremity muscle strength scale before and after ROM treatment. Table 5 shows the results of the Wilcoxon test with a p-value = 0.002. The test results mean a change in the lower extremity muscle strength scale after the ROM intervention. The limitations include the limited time of research preparation, which is only two months, and researchers do not make home visits to patients, so researchers cannot monitor whether family plays a role in Range Of Motion (ROM) exercises or not.

CONCLUSION

There is an effect of giving active Range of Motion (ROM) on muscle strength in patients with non-hemorrhagic stroke at the Jakarta Metropolitan Regional Police Health Center. Therefore, health workers are expected to plan preventive actions, the impact of stroke, and ROM exercises through health education to members of the National Police. In addition, the results of this study can be used as a reference or teaching material for nursing students and as a source of information regarding the provision of independent ROM (Range of Motion) nursing interventions in non-hemorrhagic stroke patients.

REFERENCES

- Adriani., Sari, N. (2019). Pengaruh Latihan Range of Motion (ROM) Aktif terhadap Peningkatan Kekuatan Otot Ekstremitas Bawah Lansia. *Real in Nursing Journal*, 2 (3), 118-125.
- Arikunto, S. (2010). *Prosedur Penelitian Suatu Pendekatan Praktik*, Rineka Cipta: Jakarta.
- Bambang Trisnowiyanto. (2012). *Instrumen Pemeriksaan Fisioterapi dan Penelitian Kesehatan*. Nuha Medika: Yogyakarta.
- Benjamin EJ, Virani SS, Callaway CW, Chamberlain AM, Chang AR, Cheng S, et al. (2018). Heart disease and stroke statistics - 2018. *American Heart Association Circulation*, 137(12), E67-492.
- Baughma, D.C., Hackley, J.C. (2000). *Keperawatan Medical- Bedah Buku Saku Dari Brunner&Suddarth (Terjemahan)*. EGC: Jakarta.
- Go, A. S., Mozaffarian, D., Roger, V. L., Benjamin, E. J., Berry, J. D., Borden, W. B., & Turner, M. B. (2012). Heart Disease and Stroke Statistics. *Circulation*, 127(1).
- Hartinah, S., Pranata, L., & Koerniawan, D. (2019). Efektivitas Range Of Motion (Rom) Aktif Terhadap Kekuatan Otot Ekstremitas Atas Dan Ekstremitas Bawah Pada Lansia. *Publikasi Penelitian Terapan Dan Kebijakan*, 2(2), 113 – 121.
- Hidayat, A.A. (2012). *Riset Keperawatan dan Teknik Penulisan Ilmiah*. Salemba Medika: Jakarta.
- Indahsari, P. N., MM, F. A., & Ekowati, S. I. (2013). Hubungan Perubahan Fungsi Fisik terhadap Kebutuhan Aktivitas Hidup Sehari-Hari (AHS) Pada Lansia Dengan Stroke (Studi Pada Unit Rehabilitasi Sosial Kota Semarang). *Jurnal Keperawatan Komunitas*, 1(1), 24-32.
- Irfan, M. (2010). *Fisioterapi Bagi Insan Stroke*. Grha Ilmu: Yogyakarta.
- Kemkes RI. (2013). *Pedoman Pengendalian Stroke, Direktorat Pengendalian Penyakit Tidak Menular*. Jakarta.
- Kemkes RI. (2018). *Riset Kesehatan Dasar (Riskesdas)*. Jakarta: Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan Republik Indonesia.
- Kisner, C. and Colby, L.A. (2012). *Therapeutic Exercise: Foundations and Techniques*. F.A. Davis Company: Philadelphia.
- Kozier et al. (1995). *Fundamental of Nursing: Concept, Process, and Practise, fourth edition*. Addison Wesley: California.
- Laily, S.R. (2017). Hubungan Karakteristik Penderita dan Hipertensi dengan Kejadian Stroke Iskemik. *Jurnal Berkala Epidemiologi*, 5(1), 48-59.
- Lewis, Dirksen, Heitkemper, & Bucher. (2014). *Medical-surgical nursing. Assessment and management of clinical problems (9th edition)*. St. Louis: Mosby.
- Misbach J. (2011). *Stroke, Aspek Diagnostik, Patofisiologi, Manajemen*. Balai Penerbit FK UI: Jakarta.
- Muttaqin, A. (2014). *Asuhan Keperawatan Klien Dengan Gangguan Sistem Persarafan*. Salemba Medika: Jakarta.
- Ningsih, R. (2018). Faktor-Faktor yang Berhubungan dengan Risiko Kejadian Stroke di Ruang Rawat Inap A di Rumah Sakit Stroke Nasional Bukit Tinggi Tahun 2017. *Menara Ilmu*, 7(7), 79-89.
- Notoatmodjo, S. (2010). *Metode Penelitian Kesehatan*. Rineka Cipta: Jakarta.

- Nurarif, A. H. & Kusuma, H. (2015). *Aplikasi Asuhan Keperawatan berdasarkan Diagnosa Medis dan Nanda Nic Noc (Jilid 3)*. Mediation: Jogja.
- Nursalam. (2011). *Manajemen keperawatan: aplikasi dalam praktik keperawatan*. Salemba Medika: Jakarta
- Nursalam. (2013). *Konsep dan Penerapan Metodologi Penelitian Ilmu Keperawatan*, Salemba Medika: Jakarta
- Nursalam. (2016). *Metodologi Penelitian Ilmu Keperawatan*, Salemba Medika: Jakarta
- Perry & Potter. (2009). *Fundamental Of Nursing*. Salemba Medika: Jakarta.
- Perry & Potter. (2012). *Fundamental Of Nursing*. Salemba Medika: Jakarta
- Rahayu, E.O. (2016). Perbedaan Resiko Stroke berdasarkan faktor resiko biologi pada usia produktif. *Jurnal Berkala Epidemiologi*, 4(1), 113-125.
- Santoso, H. & Ismail, A. (2009). *Memahami Krisis Lanjut Usia: Uraian Medis dan Pedagogis Pastoral*. Gunung Mulia: Jakarta.
- Saryono. (2009). *Metodologi Penelitian Kesehatan Penuntun Praktis Bagi Pemula*. Mitra Cendikia Press: Jogjakarta.
- Setiadi. (2013). *Konsep dan praktek penulisan riset keperawatan (Ed.2)*. Grha Ilmu: Yogyakarta.
- Setyopranoto, I. (2011). Stroke: Gejala dan Penatalaksanaan. *Cermin Dunia Kedokteran*, 38(4), 247-250.
- Sugiyono. (2010). *Metode Penelitian Kuantitatif, kualitatif dan R & D*. Alfabeta: Bandung.
- Suratun, dkk. (2013). *Klien Gangguan Sistem Muskuloskeletal*. EGC: Jakarta.
- Susanti., Bistara, D.N. (2019). Pengaruh Range of Motion terhadap Kekuatan Otot pada Pasien Stroke. *Jurnal Kesehatan Vokasional*, 4(2), 112-117.
- Tulandi. (2014). Hubungan Antara Dukungan Keluarga dengan Kemandirian Activity of Daily Living Pasca Stroke. *Jurnal Berkala Epidemiologi*, 4(2), 213-224.
- Veerbeek, Janne Marieke, Erwin van Wegen, Roland van Peppen, Erik Hendriks Hendriks, Marc Rietberg, and Gert Kwakkel. (2014). "What Is the Evidence What Is the Evidence A Systematic Review and Meta-Analysis." *Evidence for Physical Therapy Poststroke*, 1.
- Wijaya, A. S., & Putri, Y. M. (2013). *KMB 2 Keperawatan Medikal Bedah Keperawatan Dewasa Teori dan Contoh Askep*. Nuha Medika: Yogyakarta.
- Winstein, C. J., Stein, J., Arena, R., Bates, B., Cherney, L. R., Cramer, S. C., and Zorowij, R. D. (2016). Guidelines for Adult Stroke Rehabilitation and Recovery: A Guideline for Healthcare Professionals. *American Heart Association/American Stroke Association*, 47(6).
- Yueniwati, Y. (2015). *Deteksi Dini Stroke Iskemia dengan Pemeriksaan Ultrasonografi Vaskular dan Variasi Genetika*. Universitas Brawijaya Press: Malang.